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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,174	02/20/2004	Larry F. Rhodes	PHR203-0004 US	7299

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EXAMINER	
CHU, JOHN S Y	

ART UNIT	PAPER NUMBER
1752	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/783,174	RHODES ET AL.	
	Examiner	Art Unit	
	John S. Chu	1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to the amendment filed July 5, 2006.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims remain indefinite with respect to the recited language reciting the "desired exo mole percent is greater than or less than the expected exo isomer mole percent for a polycylic olefin monomer". The conditions for deriving the monomers based on the Diels-Alder reaction is unclear as to the precursors used. The precursors having certain substituted groups can alter the expected formation of exo isomer and endo isomers derived.

Thus the claims without specifying the precursors and the reaction time and temperature used provide no guidance as to the expected isomer formation leaving the claim indefinite and ambiguous.

The claims do not clearly define the metes and bounds of the invention so that others attempting to avoid infringement would not be guided as to the claimed scope.

The argument and declaration under Rule 1.132 by applicant have been carefully considered, however the rejection is repeated with respect to the claims remaining indefinite and unclear, so that one attempting to avoid infringement would not know the metes and bounds of

the claimed scope. The type of reaction conditions (thermal dynamic reaction control) including temperature, pressure, volume along with other reaction conditions will determine the chemical equilibrium giving an exo isomer mole percent. And without the recited scope, others would not know where the line of infringement lives. Correction is necessary to crystallize the intended scope of protection.

Claims 1-8 were selected for rejection because claims 9-11 were seen to recite a specific monomer which when reacted to a thermodynamic equilibrium could obtain an expected exo-mole percent.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by KINSHO et al (6,284,429 B1).

The claimed invention is now drawn to the following:

1. (Currently Amended) A photoresist composition comprising a polymer having a desired dissolution rate, said polymer comprising at least one polycyclic olefin derived type of repeat unit having a desired exo mole percent, where the desired exo mole percent is greater than or less than the expected exo isomer mole percent for a polycyclic olefin monomer from which the polycyclic olefin type of repeat unit is derived, such expected exo isomer mole percent based on the thermodynamic equilibrium of the isomers of such monomer that are obtained from a Diels-Alder reaction used to form such monomer.

KINSHO et al teaches an ester compound having an exo-form 2-alkylbicyclo[2.2.1]heptan-2-yl group as the protective group as well as a polymer comprising units of the ester compound. The said polymer is used as a base resin to formulate a resist composition having a high sensitivity, resolution and etching resistance compared to conventional resist compositions (abstract). See also column 6, line 57 – column 7, lines 67.

KINSHO et al disclose a protecting group which is reacted and bonded to a side group on the polymer, thus the scope of the claimed invention as to the exo-mole percent is not relevant per se, however the claimed desired exo-mole percent is the amount reacted with the polymer and would be greater than or less than the expected exo mol percent . The rejection is repeated.

6. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by SHIN et al (2003/0004289 A1).

Production Example 2 exemplifies the synthesis of 4-oxa-tricyclo[5.2.1.0(2,6)]dec-8-en-3-one (NL) having an endo and exo mixture in 80% yield (p.0057-0059). The said monomer was used to synthesize a copolymer of 5-norbornene-2-carboxylic acid (NCA) and NL (production ex.5; p.0072-0074) and a terpolymer of poly[ANCA/NCA/NL] production ex. 12; p.

0097-0099). The said copolymer of example 12 was admixed with an acid generator and a solvent to form a photoresist composition (p.0116-0120).

The rejection is repeated wherein the Office views the synthesized monomers having to be processed and "cleaned up" prior to polymerization and accordingly the exo-mole percent would be altered and would be different (greater than or less than) from the expected ex-mole percent during synthesis.

7. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by BOARDMAN et al (6,358,675 B1).

Example 8 of BOARDMAN eta l exemplifies the synthesis of a monomer Norbornene Ester 1 having an approximately 55:45 mixtue of endo and exo isomers (see column 11, line 45 – column 12, line 6)). The said ester was used in the preparation of polymer 3 (ex. 9), which is a terpolymer of bicycle[2.2.1]hept-2-ene, Norbornene Ester 1 and maleic anhydride (column 12, lines 8-27). A resist solution was then prepared by combining the said terpolymer with an acid generator and a solvent (Ex. 10; column 12, lines 29-55).

The rejection is repeated wherein the Office views the synthesized monomers having to be processed and "cleaned up" prior to polymerization and accordingly the exo-mole percent would be altered and would be different (greater than or less than) from the expected ex-mole percent during synthesis.

8. Claims 1 and 3-17 are rejected under 35 U.S.C. 102(e) as being anticipated by POSS et al (2003/0232276 A1).

Because of the indefinite metes and bounds as claimed in the current application, POSS et al is seen to anticipate the claimed invention wherein the disclosed various forms of the

endo/exo isomer are present in fluoroalkyl norbornene repeating units similar to the claimed fluorinated carbinol repeating units recited. used to make the polycyclic olefins resin.

Examples 1-32 disclose the synthesis of the repeating units of fluorinated carbinol substituted norbornene wherein the presence of the endo/exo isomers are not explicitly disclosed, however these isomers are known to be present in the reaction products. Claim 1 recites "greater than or less than the expected exo isomer mole percent...", however monomers having to be processed and "cleaned up" prior to polymerization and accordingly the exo-mole percent would be altered and would be different (greater than or less than) from the expected ex-mole percent during synthesis.

POSS et al inherently possess an isomer mole percent of endo/exo isomers which when prepared for polymerization of the repeating units would be greater than or less than the expected mole percent of the expected isomer percent based necessary prep work on monomers to be polymerized, thus the thermodynamic equilibrium of a Diels-Alder reaction giving an expected exo-mole percent would be altered and as a result meet the claimed scope. The prior art to POSS et al is seen to anticipate the claimed scope in the current application.

Claims 12 –17 are met by POSS et al when selecting a resin which would have an inherent exo-isomer mole percent. As a result the dissolution rate of the photoresist would be controlled by formulating the composition. Additional steps to show a testing process to adjust the dissolution rate may be helpful as to overcoming the rejection for claims 12-17 over POSS et al.

9. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by GOODALL et al (6,136,499).

GOOD ALL et al anticipates the claimed invention at Examples 6, 13, 14 and 15 wherein a pure exo-isomer of t-butyl ester of 5-norbornene-carboxylic acid (Ex. 6) is disclosed to make a polymer which is greater than the expected exo-isomer formation. Examples 13 discloses a pure bicycle[2.2.1]hept-5-ene exo, -2-t-butyl, exo-3-methylester of dicarboxylic acid. Example 14 and 15 discloses using bicycle[2.2.1]hept-5-ene exo, -2-t-butyl, exo-3-methylester of dicarboxylic acid diethyl ester.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. GOODALL et al (6,723,486) is a C-I-P of U.S. Patent 6,136,499 and is cited of interest for use of polycyclic polymers with acid labile groups using a pure exo-isomer to make a polymer.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Cynthia Kelly, can be reached on (571) 272-1526

The fax phone number for the USPTO is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John S. Chu
Primary Examiner, Group 1700

J.Chu
September 28, 2006